

EIB for the allergist: Differential diagnosis

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Session 3501-AAAI Meeting, San Francisco, 3/20/11

"If from running, gymnastic exercise, or from any other work, the breathing becomes difficult, it is called asthma."

--Aretaeus of Cappadocia, Second Century A.D.

but

All that wheezes, as we know, is not asthma!

I. Vocal cord abnormalities

Exercise-induced laryngeal dysfunction (EILD): Among the most frequent abnormalities mimicking EIB are laryngeal or vocal cord problems.^{1,2,3}

Vocal-cord dysfunction is particularly common in competitive young women athletes. The diagnosis should be considered when respiratory sounds, including wheezing or stridor, are most prominent with inspiration rather than with expiration, peak and/or occur during exercise rather than following exercise, and respond poorly to aggressive management of reactive airways disease. Flattening of the inspiratory phase of the flow-volume loop may be seen. Examination of the vocal cords will at times demonstrate aberrant vocal-cord movement or posterior notch. VCD may coexist with underlying RAD. Some feel that gastroesophageal reflux may contribute.

Management includes most commonly speech therapy. In some cases, inhaled anti-cholinergic agents have been effective. Few have studied the natural history of VCD, but spontaneous resolution occurs commonly. Sometimes, a clear discussion of the diagnosis itself seems to be helpful in resolving symptoms.⁴

Though less common than VCD, other laryngeal abnormalities should be considered. Among these are exercise-induced laryngeal prolapse and arytenoid collapse. Laryngomalacia, though most often the cause of inspiratory respiratory sounds in young infants and children, may even occur in adults.⁵

II. Exercise-induced dyspnea: At times, dyspnea with vigorous exercise may occur. This may be related to hyperventilation resulting in hypocapnea without bronchoconstriction. The etiology of this problem is poorly understood.⁶

III. Relationship with underlying pulmonary pathophysiology, including obstructive lung disease and restrictive abnormalities secondary to skeletal defects, obesity, diaphragmatic paralysis, and interstitial fibrosis: Chest structural abnormalities, such as pectus excavatum and scoliosis, may result in decreased exercise tolerance. Not surprisingly, dyspnea frequently accompanies interstitial lung disease. Alpha-1 antitrypsin deficiency may result in early-onset fixed airway obstruction and exertional dyspnea. Pulmonary functions should clearly demonstrate fixed airway obstruction.⁷

IV. **Exercise-induced anaphylaxis (EIAna):** EIAna should be easily differentiated from EIB by accompanying symptoms of pruritus, urticaria, upper airway congestion, and gastrointestinal symptoms. EIAna may be associated with specific allergy or may occur independently of specific foods. Co-factors, including use of aspirin, premenstrual exacerbation, and inhaled allergens, may be contributing factors.⁸

V. **Cardiovascular or pulmonary mechanisms other than asthma:** Without objective evidence for EIB, other etiologies must be considered. This includes cardiac-associated dyspnea and arrhythmias. Cardiac consultation should be considered.

VI. **Vascular rings and other structural abnormalities** are possible, suggested by decreased peak flow rates and fixed obstruction on inspiratory and expiratory flow-volume loops. Congenital tracheobronchial stenosis should be considered with inspiratory and expiratory flow-volume loops which show fixed obstruction.

VII. **Deconditioning:** A common reason for exercise-induced dyspnea in childhood, is poor conditioning.⁹

VIII. **EIB and GERD:** The association between EIB and gastroesophageal reflux is controversial. It is felt that many individuals with GERD are diagnosed with exercise-induced bronchospasm, but the relationship is unclear.^{10,11}

IX. **Psychological factors:** The possibility that psychological factors other than VCD or EIB may contribute to symptoms should be kept in mind.¹²

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